Stormwater and Combined Sewer Overflows Program

Directory of Program Elements

Stormwater Problem Definition

Stormwater, or urban runoff, is rain or snow that falls on impervious surfaces[1] and is routed to natural or artificial drainage systems or water bodies. This also includes runoff from homes and businesses that results from excessive lawn or garden watering, car or equipment washing, spills or leaking storage containers. Stormwater can cause significant problems if not adequately managed and treated.

The first stormwater management controls were designed to prevent flooding and property damage. Conveyance systems were built to efficiently carry stormwater offsite to streams, rivers and bays. However, as our ability to monitor water and sediment quality has improved, stormwater has been found to be a significant contributor to water pollution and habitat loss.

When stormwater travels over developed land, pollutants (such as heavy metals, oil and grease, organic toxins, bacteria, nutrients and sediment) are carried into the stormwater stream. The sources of these pollutants are diverse. Oil, grease and metals come from motor vehicles and poor household and business practices. Improperly used or stored pesticides, paints, preservatives and solvents contribute organic toxins. Bacteria can be introduced from pet and farm animal wastes and failing septic systems. Nutrients can come from improperly applied fertilizers. Sediment flows from unprotected development sites.

These pollutants can have severe effects on aquatic resources. Heavy metals, oil and grease, and organic toxins can contaminate sediments and be toxic to fish and other aquatic life. Bacteria can

[1]Impervious surfaces are hard surfaces that either prevent or retard the entry of water into the soil mantle as under natural conditions prior to development. A hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces (*Stormwater Management in Washington State,* Department of Ecology, Final Draft August 2000).

What does "shall" mean?

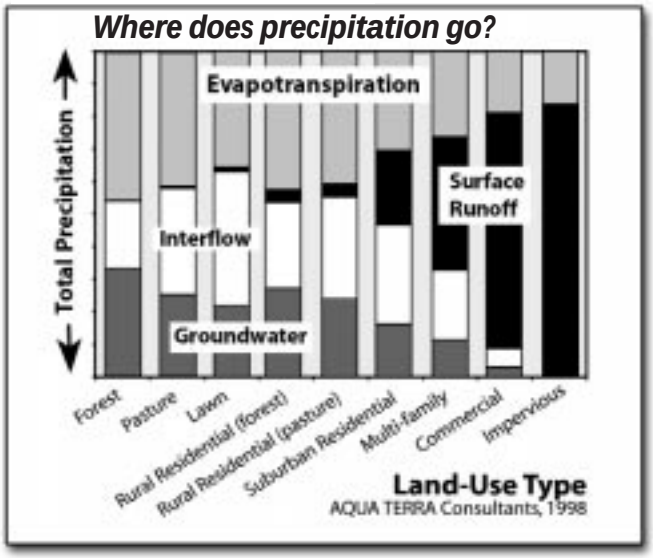
The Action Team has determined that the actions in this plan are needed to protect and restore Puget Sound. Consistent with the importance of these actions, this plan says that appropriate implementers "shall" perform the actions. However, implementation of many of these actions is a long-term process. The Action Team's work plans will identify the actions that need to be taken each biennium to implement this management plan. Implementation of actions in the work plans is subject to the availability of funds and public input into the decision-making processes of implementing entities. When an action is included in a biennial work plan, the Action Team expects that it will be implemented in accordance with the relevant provisions of the Puget Sound management plan, in accordance with Chapter 90.71 RCW.

close productive shellfish beds and public beaches. Sediment can smother fish habitat, clog fish gills, impair plant growth and transport other pollutants. Nutrients can cause plant blooms in lakes and bays that prevent swimming and deplete oxygen needed by fish and other aquatic life. Most recently, attention has focused on the role of stormwater runoff in the loss of salmon habitat in Puget Sound, especially since chinook and chum salmon and bull trout were listed as threatened under the Endangered Species Act.

Studies show that as a watershed is developed, and forests are replaced by impervious surfaces, a number of changes take place in the environment[2]. First, runoff from developed lands during the wet winter months is much greater. When discharged to streams, this increased runoff destabilizes stream channels and degrades or destroys valuable fish and wildlife habitat. Next, the impervious surface area prevents rain and snowfall from seeping into the ground and recharging streams, wetlands and aquifers. The result is a disruption of the hydrologic cycle. Streams experience exceptionally high flows during the wet months and exceptionally low flows during the dry summer months. Fish passage becomes difficult or impossible due to insufficient water flow. Wetlands experience extreme fluctuations of water level (washing away nests and eggs) and aquifers receive less recharge (affecting our water supply). These effects can be detected in watersheds with less than 10 percent impervious surface coverage. Effects grow more serious when impervious coverage exceeds 15 percent of a watershed. Figure 5 shows how surface water runoff (shown in black) varies dramatically among various land uses.

Explosive growth in the Puget Sound region within the last 10 to 15 years has led to significant alteration of the landscape. In many areas, forest cover has been lost, replaced by a range of impervious surfaces. The cumulative effects of this development can't be fully mitigated by engineered solutions at individual development sites. Care must be taken in determining where development is allowed; the extent of impervious surface area within each watershed; and how forests, streams, wetlands and other sensitive areas are protected. Discharging stormwater to shallow injection wells can also threaten groundwater resources and pose liability risks to municipalities that are out of compliance with state regulations (Chapter 173-218 WAC).

Figure 5



Comprehensive land-use planning under the Growth Management Act (GMA), including sizing urban growth areas, assigning zoning and densities, and protecting critical areas and natural resource lands, is critical to managing stormwater and protecting water resources. Watershed or basin planning is an excellent tool for assessing natural resources and pollution sources. Low-impact development practices, such as using native vegetation to treat and infiltrate stormwater, provide a viable alternative to traditional development techniques. Retaining minimum forest cover and setting watershed goals for impervious surfaces helps manage the effects of development at the landscape or watershed scale. Combined, these techniques may prove to be the most effective best management practices we can employ.

Combined Sewer Overflows

Problem Definition

Combined sewer systems collect sanitary sewage, industrial wastewater and stormwater in a single sewer system. During large rainstorms, total flows can exceed the capacity of sewer collection systems or treatment facilities. When this occurs, the system is designed to overflow to streams, lakes and bays—discharging a combination of untreated sewage and stormwater. Discharges from combined sewer overflows frequently contain large amounts of bacteria,

2 "Watershed Urbanization and the Decline of Salmon in Puget Sound Streams," Horner and May, Salmon in the City Conference, 1998.

pathogens, nutrients, suspended solids and floatable matter. These contaminants can pose public health risks, contribute to shellfish harvest restrictions, and degrade aquatic habitat.

Since the mid-1950s, the U.S. Environmental Protection Agency (EPA) policy and standard engineering practice have been to install separate sanitary and storm sewers for newly developed areas. However, 10 municipalities around Puget Sound have combined sewer systems built prior to that time.[3] Fortunately, all have developed reduction plans that have been approved by the Department of Ecology. Ecology estimates that since 1988, the average annual volume of untreated combined sewer overflow to state waters has decreased from 3.3 billion to 2 billion gallons.[4]

Institutional Framework

Federal and state statutes require stormwater management in the Puget Sound basin. Under the federal Clean Water Act and RCW 90.48, Ecology administers National Pollutant Discharge Elimination System (NPDES) stormwater permits for municipalities, industries, construction sites and the Washington State Department of Transportation (WSDOT). Municipalities with populations over 100,000 are currently covered by NPDES "Phase I" permits. In Puget Sound, this includes King, Pierce and Snohomish counties and the cities of Seattle and Tacoma. Municipalities with populations under 100,000 located in urbanized areas will be covered under "Phase II" permits by March 2003. In addition, a number of other smaller jurisdictions located outside urbanized areas will be reviewed for coverage under this permit. Ecology also maintains the region's stormwater technical manual, which contains minimum technical standards and best management practices for managing stormwater from all new development and redevelopment projects in the basin.

The EPA issues NPDES permits to federal facilities located in Puget Sound.

The recent listing of Puget Sound chinook and chum salmon and bull trout as threatened under the Endangered Species Act has profound implications for the region. The Governor's Salmon Recovery Office published the Statewide Strategy to Recover Salmon in November 1999. King, Snohomish and Pierce counties are also developing a stormwater management framework for federal review.

The *Puget Sound Water Quality Management Plan* calls on all local governments to develop comprehensive stormwater management programs that include the tools described above. The state is to maintain standards, issue permits, and provide assistance, guidance and training. State, federal and tribal governments are to manage runoff from their lands. Cities and counties are to achieve the greatest reasonable reduction in combined sewer overflows. Universities and local, state, federal and tribal governments are to cooperate to conduct research and disseminate findings. Progress will be measured through performance measures and the program will be adjusted as needed.

Program Goal

To protect and enhance the health of Puget Sound's aquatic species and habitat, natural hydrology and processes, and water quality, and to achieve standards for water and sediment quality by managing stormwater runoff and reducing combined sewer overflows.

Program Strategy

The strategy for achieving this goal is to:

a. Develop and carry out local programs that combine land use and watershed planning and comprehensive stormwater management;

b. Maintain minimum technical standards, issue municipal, industrial and construction NPDES permits that are consistent with this program; and provide guidance, technical and financial assistance and training;

c. Manage runoff on state, federal and tribal government land;

d. Achieve the greatest reasonable reduction in combined sewer overflows;

[3] King County and the cities of Anacortes, Bellingham, Bremerton, Everett, Mount Vernon, Olympia, Port Angeles, Seattle and Snohomish.

[4] Department of Ecology, *Brief Sheet on Combined Sewer Overflows*, January 1999.

e. Conduct cooperative research and disseminate findings; and

f. Measure progress through performance measures and adjust the program as needed.

SW-1. Local Government Planning and Stormwater Programs

Local government planning and stormwater management programs are critical components of a strategy to protect Puget Sound. Tools available to local governments include growth management and watershed planning, development regulations, capital investment and stormwater management programs. This element calls on local governments to use all these tools to gain maximum benefit from all these measures.

SW-1.1. Growth Management Planning

Every city and county required to plan under the Growth Management Act (GMA) shall review and revise, as necessary, countywide planning policies, local comprehensive plans and policies, zoning, capital facilities plans and development regulations to ensure that development does not degrade water quality, aquatic species and habitat, and natural hydrology and processes. Cities and counties should also incorporate provisions for managing stormwater into updates of their local shoreline master programs, and should designate appropriate land for future stormwater mitigation purposes. This review shall be completed according to GMA amendment timelines using best available science and shall include:

a. Designating urban growth management areas with appropriate densities and sufficient capital facilities to reduce sprawl;

b. Providing sufficient vegetative buffers and development setbacks in critical areas ordinances to protect riparian zones, shorelines, wetlands and other sensitive areas;

c. Assessing how full build-out according to the comprehensive plan will alter natural hydrology, water quality and aquatic species; and

d. Incorporating measures to retain natural hydrology and processes, such as establishing goals for limiting effective impervious surfaces[5] and preserving open spaces and forests.

SW-1.2. Comprehensive Stormwater Programs for Cities and Counties

Every city and county shall develop and implement a comprehensive stormwater management program. Stormwater programs will vary among jurisdictions, depending on the jurisdiction's population, density, threats posed by stormwater, and results of watershed planning efforts. Cities and counties are encouraged to form intergovernmental cooperative agreements in order to pool resources and carry out program activities most efficiently. Programs shall include:

a. **Stormwater Controls for New Development and Redevelopment[6]** – Adopt ordinances that require the use of best management practices (BMPs) to control stormwater flows, provide treatment, and prevent erosion and sedimentation from all new development and redevelopment projects. Adopt and require the use of the Department of Ecology's stormwater technical manual (or an alternative manual developed under SW-1.3) to meet these objectives. All new development in the basin, particularly new development sited outside of urban growth areas, shall seek to achieve no net detrimental change in natural surface runoff and infiltration.

b. **Stormwater Site Plan Review**–Review new development and redevelopment projects to ensure that stormwater control measures are adequate and consistent with local requirements.

c. **Inspection of Construction Sites**–Regularly inspect construction sites and maintain temporary BMPs according to guidance developed under SW-2 and 3. Adopt ordinances to ensure clear authority to inspect construc-

[5]Effective impervious surfaces are impervious surfaces that are connected via sheet flow or discrete conveyance to a drainage system (adapted from *Stormwater Management in Washington State,* Department of Ecology, Final Draft August 2000).

[6]On an already developed site, the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; land disturbing activities associated with structural or impervious redevelopment . (*Stormwater Management in Washington State,* Department of Ecology, Final Draft August 2000.)

tion sites, to require maintenance of BMPs and to enforce violations. Provide local inspectors with training under SW-3 on erosion and sediment control practices.

d. **Maintenance of Permanent Facilities**–Adopt ordinances that require that all permanent stormwater facilities be regularly maintained according to guidance developed under SW-2 and 3 to ensure performance. Develop provisions as necessary, such as agreements or maintenance contracts, to ensure that facilities on private land (e.g., residential subdivisions and commercial complexes) are maintained. Provide training under SW-3 for professionals who maintain stormwater facilities.

e. **Source Contro**l–Develop and implement a program to control sources of pollutants from new development and redevelopment projects and from existing developed lands, using BMPs from Ecology's stormwater technical manual. Source control activities shall include pollution from roadways and landscaping activities. Integrated pest management practices shall be used to manage roadside vegetation.

f. **Illicit Discharges and Water Quality Response**–Adopt ordinances to prohibit dumping and illicit discharges. Carry out activities to detect, eliminate and prevent illicit discharges, and respond to spills and water quality violations.

g. **Identification and Ranking of Problems**–Identify and rank existing problems that degrade water quality, aquatic species and habitat, and natural hydrologic processes. Local governments may choose to achieve this through watershed or basin planning (SW-1.2.j) or another process. Conduct a hydrologic analysis and map stormwater drainages, outfalls and impervious surfaces by watershed. Develop plans and schedules and identify funding to fix the problems.

h. **Public Education and Involvement**–Educate and involve citizens, businesses, elected officials, site designers, developers, builders and other members of the community to build awareness and understanding of stormwater and water quality issues. Provide practical alternatives to actions that degrade water quality and biological resources.

i. **Low Impact Development Practices**–Adopt ordinances that allow and encourage low impact development practices. These are practices that infiltrate stormwater (using proper safeguards to protect groundwater) on-site rather than collecting, conveying and discharging stormwater off site. The goals of low impact development practices are to enhance overall habitat functions, reduce runoff, recharge aquifers, maintain historic in-stream flows and reduce maintenance costs. Low impact development provides a variety of benefits, including cost savings and added market appeal, additional green space for recreational users and greater esthetic appeal than traditional facilities. Low impact development practices may not be appropriate for all sites. Low impact principles include:

   i. Maintain the pre-developed, undisturbed stormwater flows and water quality;

   ii. Retain native vegetation and soils to intercept, evaporate and transpire stormwater on the site (rather than using traditional ponds and conveyances);

   iii. Emphasize a higher standard of soil quality in disturbed soils (by using compost and other methods) to improve infiltration, reduce runoff and protect water quality;

   iv. Cluster development and roads on the site and retain natural features that promote infiltration; and

   v. Reduce impervious surface area and use permeable surfaces instead.

   Low impact development projects should include methods to collect and reuse stormwater from rooftops for household reuse (e.g. toilets and washing machines) and for landscape watering.

j. **Watershed or Basin Planning**–Participate in watershed or basin planning processes, such as planning under Chapter 400-12 WAC or Chapter 90.82 RCW, in order to coordinate efforts, pool resources, ensure consistent methodologies and standards, maintain and restore watershed health, and protect and enhance natural hydrology and processes, including natural surface runoff, infiltration and evapotranspiration. Progress in achieving this goal shall include biological monitoring. Cities and counties may choose watershed or basin planning processes to identify

and rank existing stormwater problems, develop a plan and schedule to fix the problems, and set goals for limiting effective impervious surfaces and preserving open spaces and forests. Basin planning should use continuous runoff modeling to simulate existing and potential impacts of land use and water management on natural hydrology. Basin plans shall address water quality, aquatic habitat, groundwater recharge and water re-use. Basin plans may prescribe stronger stormwater management measures to protect sensitive resources in a certain basin or sub-basin. Stormwater management measures in all basins shall at least meet the minimum requirements of Ecology's technical manual. Cities and counties shall incorporate recommendations from watershed or basin plans and specific requirements from Total Maximum Daily Load (TMDL) Water Cleanup Plan processes[7] into their stormwater programs, land use comprehensive plans and site development ordinances.

k. **Funding**–Create local funding capacity, such as a utility, to ensure adequate, ongoing funding for program activities and to provide funding to contribute to regional stormwater projects.

l. **Monitoring**–Monitor program implementation and environmental conditions and trends over time (according to guidance developed under SW-2 and 3) to measure the effectiveness of program activities. Periodically share monitoring results with local and state agencies, citizens and others.

m. **Schedule for Implementation**–Develop an implementation schedule with specific target dates and funding sources to help plan program activities.

SW-1.3. Alternative Technical Manuals

Cities and counties that choose to develop an alternative technical manual (SW-1.2a.) shall submit their manual to Ecology. The submittal shall include an outline of significant differences between the manuals and shall demonstrate how the alternative manual is substantively equivalent to Ecology's. Ecology shall work with jurisdictions to ensure that all alternative manuals meet or exceed the standards in Ecology's technical manual. Jurisdictions choosing to develop an alternative manual shall use Ecology's technical manual in the interim.

SW-1.4. Local Program Evaluation, Reporting and Modification

Cities and counties shall review their monitoring data and program records at least every five years (or according to another schedule approved by the Action Team) to evaluate whether program goals are being met and whether any modifications to the program are needed. Ecology and the Action Team support staff shall work with cities and counties to develop a system to assess regional progress.

Target Dates for SW-1.1 through 1.4: Cities and counties shall revise their stormwater programs to incorporate the elements described above by March 2003, or earlier, according to the requirements and schedule in the municipal NPDES permit. (Under the *1994 Puget Sound Management Plan*, jurisdictions were to have adopted basic stormwater programs by 1995.) All alternative manuals shall be completed by March 2003.

SW-2. Stormwater Technical Manual and Federal Permits

A single technical stormwater manual for the region provides uniform standards and a central repository for BMPs. Ecology will maintain the region's technical stormwater manual, and issue and oversee National Pollutant Discharge Elimination System (NPDES) permits for municipalities, industries and construction activities.

SW-2.1. Stormwater Technical Manual

Ecology shall maintain a stormwater technical manual for new development and redevelopment with overall goals of protecting and restoring aquatic species and habitat, water quality and natural hydrology and processes, including achieving no net detrimental change in natural infiltration and surface runoff, particularly for new development

[7]The Total Maximum Daily Load (TMDL) or Water Cleanup Plan process is established by section 303(d) of the Clean Water Act. Federal law requires states to identify sources of pollution in waters that fail to meet state water quality standards, and to develop Water Cleanup Plans to address those pollutants. The Water Cleanup Plan establishes limits on pollutants that can be discharged to the water body and still allow state standards to be met (Department of Ecology).

sited outside of urban growth areas. The manual shall:

a. Encourage use of stormwater as a resource to recharge aquifers, streams and wetlands and maintain the natural hydrology of the watershed;

b. Incorporate recent research findings regarding techniques for stormwater management including low impact development practices; need for and feasibility of matching predeveloped surface runoff, infiltration and evapotranspiration; recommended percentages for maintaining forest cover and limiting impervious surfaces; and effects of urbanization and stormwater runoff on aquatic resources;

c. Discuss the relationship of the technical manual to local, state and federal regulations;

d. Describe the role of local land use planning in effective stormwater management and suggest guidance materials such as those developed by the Office of Community Development (OCD);

e. Provide minimum technical requirements for all new development and redevelopment;

f. Provide standards for the design, operation and maintenance of public and private temporary and permanent stormwater facilities and structures;

g. Provide a design storm and hydrologic runoff model to estimate runoff;

h. Provide BMPs for:

   i. Controlling erosion and sedimentation from construction activities (including methods to ensure that disturbed, post-construction soils possess a minimum level of quality);

   ii. Controlling and infiltrating stormwater flow with proper safeguards to protect groundwater, to protect natural hydrology and processes and maintain adequate stream flows;

   iii. Treating and removing pollutants;

   iv. Controlling sources of pollutants;

   v. Low impact development practices (see SW-1.2i);

   vi. Innovative land clearing practices, including clearing in sections and preserving forests, vegetation and open spaces; and

   vii. Collecting and using stormwater from rooftops for household uses (e.g. toilets and washing machines) and for landscape watering.

i. Provide guidance on preparing stormwater site plans, selecting BMPs and strengthening minimum requirements through watershed or basin planning, and monitoring; and

j. Provide performance standards for BMPs.

SW-2.2. Performance Standards for BMPs

Ecology, in cooperation with the American Public Works Association (APWA), local governments, universities and the Washington State Department of Transportation (WSDOT), shall develop performance standards for BMPs currently approved in the technical manual. Ecology shall include performance standards in future updates of the technical manual. Groundwater shall be protected in accordance with Ecology's Underground Injection Control Program.

SW-2.3. New and Experimental BMPs

Ecology, in cooperation with the APWA, local governments, universities and WSDOT, shall develop protocols for evaluating and reviewing new and experimental BMPs. Entities conducting research on the effectiveness of BMPs under this element and SW-7 shall follow these protocols. Ecology shall periodically distribute supplemental information on BMPs to local governments, state agencies, tribal governments, businesses and others.

SW-2.4. Revisions to the Technical Manual

Ecology shall convene a committee at least once every five years to review continued adequacy of the technical manual. The committee shall include representatives from local, state, federal and tribal governments, non-profit groups, business and citizens. National experts shall also be consulted. Based on the review, Ecology shall update portions of the technical manual to ensure that the manual continues to reflect the best approaches to stormwater management.

SW-2.5. National Pollutant Discharge Elimination System Stormwater Permits

Ecology shall issue NPDES stormwater permits for municipalities, construction sites and industries as required by state and federal regulations. In deter-

mining whether small municipalities outside of census urbanized areas must obtain municipal stormwater permits, Ecology shall develop criteria to evaluate whether stormwater discharges result in or have the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant water quality impacts, including habitat and biological impacts. The evaluation criteria shall be based on a balanced consideration of the following criteria on a watershed or other local basis: discharge to sensitive waters; high growth or growth potential; high population density; contiguity to an urbanized area; significance of the contribution of pollutants to waters of the United States; and the effectiveness of protection of water quality by other programs. Ecology shall ensure that all municipal permits issued for Puget Sound cities and counties are consistent with the elements described in SW-1.2. Before issuing permits, Ecology shall consult with interested parties that include permittees, local, state, federal and tribal governments, businesses, environmental groups and citizens.

Target Dates for SW-2.1 through 2.5: Ecology shall begin issuing performance criteria and protocols for evaluating new BMPs starting in June 2001. Ecology shall reissue federal NPDES phase I municipal permits by April 2001 and issue NPDES phase II municipal permits to Puget Sound jurisdictions by December 2002. Ecology shall conduct a review of the technical manual at least every five years, starting in 2005.

SW-3. Guidance, Assistance and Training

Cities and counties will need assistance to develop effective local stormwater programs. The state will help by developing additional guidance and model ordinances, and providing technical and financial assistance (see the Estuary Management Program for financial assistance). A broad-based committee will regularly assess training needs and make recommendations for new or enhanced training.

SW-3.1. Guidance

Ecology, OCD, the Department of Fish and Wildlife and the Action Team support staff, with advice from local governments and WSDOT, shall periodically review existing guidance and develop additional guidance as necessary to ensure that guidance is available to cities and counties developing local programs under SW-1. Guidance shall be available on:

a. Adopting ordinances and development regulations;
b. Adopting stormwater utilities;
c. Educating and involving the public;
d. Land use planning to protect sensitive areas and aquatic resources;
e. Minimizing impervious surfaces on individual sites and throughout watersheds;
f. Using low impact development practices to treat and infiltrate runoff on site;
g. Preserving trees and native vegetation;
h. Inspecting and maintaining stormwater facilities;
i. Implementing a source control program;
j. Handling and disposal of street waste;
k. Monitoring program effectiveness and environmental response;
l. Prioritization science together with cost-benefit analysis; and
m. Use of alternative mitigation policy that does not jeopardize water quality standards.

Ecology, OCD, the Governor's Salmon Recovery Office, Fish and Wildlife, WSDOT and the Action Team support staff shall develop guidance on ranking existing stormwater problems that degrade water quality and fish and wildlife habitat. Ecology, in cooperation with area businesses, shall develop guidance for businesses covered by NPDES stormwater permits.

SW-3.2. Model Ordinances

Ecology and the Action Team support staff, with advice from local governments, shall ensure that model ordinances are available to cities and counties that are developing comprehensive programs under SW-1.2.

SW-3.3. Technical Assistance

The Action Team support staff shall coordinate state technical assistance to cities and counties that are developing comprehensive stormwater programs. State agencies providing technical assistance shall include Ecology, OCD, Fish and Wildlife and the Action Team. Ecology shall provide technical assistance to industries that are implementing NPDES stormwater permits.

SW-3.4. Training

The Action Team support staff shall convene a committee at least every two years to assess current training opportunities and make recommendations to the Council and Action Team on the need for additional training for local government staff, the building community and others on stormwater management techniques. The committee shall include universities, local governments, Ecology, OCD, Fish and Wildlife and WSDOT.

SW-3.5. Public Educational Materials

The Action Team, Ecology, OCD, Fish and Wildlife and other state agencies shall develop and distribute educational materials related to this program to the general public, local governments, businesses and others.

SW-3.6. Agency Coordination and Permit Streamlining

State and local agencies that issue stormwater-related permits (e.g., NPDES permits, Hydraulic Project Approvals), with the assistance of Action Team support staff, shall seek opportunities to coordinate efforts and streamline the permitting process.

Target Dates for SW-3.1 through 3.6: Additional guidance and model ordinances shall be made available to cities and counties beginning June 2001. The Action Team support staff shall convene a committee to discuss training needs and develop recommendations every two years, beginning in June 2001.

SW-4. Stormwater Runoff from State Highways

Runoff from state highways can have a significant effect on the Sound's water quality and biological resources. WSDOT can avoid or mitigate these effects through project planning, controls at construction sites, operation and maintenance, research, interagency coordination and retrofit of existing facilities.

SW- 4.1. Highway Runoff Program

WSDOT, in consultation with Ecology, Fish and Wildlife, the Department of Natural Resources (Natural Resources), local governments and the Action Team support staff, shall develop and carry out a program to manage stormwater runoff from all state highways that includes:

a. Methods to ensure that stream channels, and aquatic species and their habitat are protected and stream crossings are minimized;
b. Implementation of a federal NPDES permit;
c. Adoption and use of a stormwater technical manual that has been approved by Ecology;
d. Regular inspection of construction sites and use of BMPs to control erosion;
e. Regular maintenance of temporary and permanent stormwater facilities and structures;
f. Improvement of existing facilities when roadways are redeveloped;
g. Identification and ranking of existing stormwater problems that degrade water quality and fish and wildlife habitat, and planning and scheduling to fix these problems;
h. Recognition of stormwater as a resource to recharge aquifers, streams and wetlands;
i. Use of low impact development practices, when appropriate, to treat and infiltrate runoff on site rather than collecting and conveying the runoff off site;
j. Preservation of native vegetation, use of permeable surfaces and use of amended soils to improve infiltration;
k. Use of integrated pest management practices to manage roadside vegetation;
l. Activities to respond to spills and water quality violations;
m. An implementation schedule; and
n. Monitoring to measure program implementation and environmental response.

WSDOT shall phase in the technical standards of Ecology's technical manual once it is adopted, in accordance with the NPDES permit schedule and with accommodation to the project development process. Ecology shall review and approve the WSDOT manual to ensure that it is technically equivalent to Ecology's manual for the basin.

SW-4.2. NPDES Permit

Ecology, in consultation with WSDOT, Fish and Wildlife, Natural Resources, local governments and the Action Team support staff, shall revise the NPDES permit according to a schedule determined by Ecology and in accordance with federal law.

SW-4.3. Puget Sound Highway Runoff Rule

Ecology, in consultation with WSDOT, Fish and Wildlife, Natural Resources, local governments and the Action Team support staff, shall review the Puget Sound Highway Runoff Rule (Chapter 173-270 WAC) and revise it as necessary.

SW-4.4. WSDOT Research

WSDOT shall continue and expand its efforts to research and demonstrate improved methods for managing stormwater from state highways and roads, and integrate findings from the National Cooperative Highway Research Program. WSDOT shall participate in and share research findings with state, federal and tribal governments as described in SW-7.

Target Dates for SW-4.1 through 4.4: WSDOT shall implement a stormwater management program for state highways according to a schedule determined by federal NPDES stormwater permit deadlines and Ecology. WSDOT shall phase in the technical standards of Ecology's technical manual once it is adopted, in accordance with the NPDES permit schedule and with accommodation to the project development process. Ecology shall review the Puget Sound Highway Runoff Rule by December 2001 and revise it as necessary.

SW-5. Runoff from Federal Facilities and Tribal Lands

Federal and tribal governments manage a significant portion of land area in the Puget Sound basin, including military bases and tribal reservations. The same practices that are used to manage stormwater on private and state lands can be used effectively on federal and tribal lands.

SW-5.1. Runoff from Federal Facilities

Managers of federal facilities shall control stormwater runoff on federal lands according to practices outlined in SW-1.2 and use Ecology's stormwater technical manual. The Environmental Protection Agency (EPA) shall ensure that all NPDES permits issued to federal facilities, including military bases, are at least as stringent as municipal, industrial and construction NPDES permits issued by Ecology. The EPA shall review and modify, as necessary, existing permits to ensure that these requirements are included. Federal facilities shall conduct monitoring to measure program implementation and environmental response and periodically evaluate and modify their programs as necessary.

SW-5.2. Runoff from Tribal Lands

Tribal governments shall manage stormwater runoff on tribal lands consistent with the practices described in SW-1.2. Tribal governments shall conduct monitoring to measure program implementation and environmental response and periodically evaluate and modify their programs as necessary.

The EPA Region 10 Indian Programs Office shall provide technical and financial assistance to help tribal governments develop effective stormwater management programs.

Target Dates for SW-5.1 through 5.2: Ongoing.

SW-6. Reducing Combined Sewer Overflows

Combined sewer overflows (CSOs) can significantly degrade the Sound's water quality and biological resources. Jurisdictions with CSOs will continue to reduce the number of CSO events to meet state standards.

SW-6.1. Local Reduction Plans

Cities and counties with CSOs shall continue to carry out reduction plans that have been approved by Ecology under Chapter 173-245 WAC. The goal of these plans shall be to meet state objectives for achieving the greatest reasonable reduction of combined sewer overflows at the earliest possible date. Greatest reasonable reduction has been defined in Chapter 173-245 WAC as no more than one overflow event per year. Ecology shall define "CSO event" with input from local, state and federal agencies, tribes, environmental groups, businesses and citizens. Reduction plans shall include sampling of receiving water sediments adjacent to each CSO to determine the presence and extent of potential contaminants, as called for by Chapter 173-245 WAC. Jurisdictions shall provide Ecology with data concerning the number of discharges and volume discharged from each CSO, and shall assess the effectiveness of their reduction plans to date.

Jurisdictions that choose to separate stormwater as a reduction technique shall use treatment BMPs, a source control program, and monitoring to ensure that aquatic resources are protected. When a jurisdiction has reduced CSOs to an average of one overflow event per year, Ecology shall consider reducing monitoring requirements to frequency of overflow events as per Chapter 173-245 WAC. Ecology shall continue to review and approve new or modified CSO reduction plans as needed.

SW-6.2. Combined Sewer Overflow Reduction Guidance

Ecology shall review the existing CSO Reduction Guidance at least once every five years to ensure that the guidance continues to reflect best science and current research findings. Ecology shall involve local, state, federal and tribal governments and members of the public in this review.

Target Dates for SW-6.1 through 6.2: Ecology shall review the CSO Reduction Guidance at least once every five years starting in 2002.

SW-7. Research

A broad-based committee will assess research needs and share research findings on a biennial basis to ensure that the region continually increases its understanding of stormwater management and resource protection.

SW-7.1. Review of Research Needs

The Action Team support staff shall convene a committee at least once every two years to assess research needs and make recommendations to the Council and Action Team regarding the need for new or enhanced research efforts. The committee shall include representatives from universities; local governments; Ecology, Fish and Wildlife, WSDOT, OCD, EPA and tribal governments.

SW-7.2. Cooperative Research Activities

Universities, non-profit organizations and local, state, federal and tribal governments that carry out research related to stormwater management shall seek opportunities to cooperate and collaborate with one another on research projects. These groups shall share research findings with one another through organizations such as the APWA Stormwater Managers Group and at conferences such as the Puget Sound Research Conference.

Research shall include:

a. Low impact development practices to treat and infiltrate runoff on site rather than collecting and conveying runoff off site;
b. Percentage of forest cover needed to protect streams and aquatic resources; need for and feasibility of matching pre-developed surface runoff, infiltration and evapotranspiration; and effectiveness of the current design storm in meeting goals;
c. Improved measures to control erosion from construction sites;
d. Effectiveness of best management practices such as long-term effects on hydrology and groundwater, including summer low flows and groundwater recharge; and
e. Effects of stormwater on wetlands, streams and aquatic species.

Research findings shall be submitted for peer review to appropriate organizations, including universities, APWA and local, state, federal and tribal governments.

SW-7.3. Sharing of Research Findings

The Action Team support staff, in cooperation with universities, local, state, federal and tribal governments, environmental organizations and the development community, shall coordinate workshops at least every two years to share research findings.

SW-7.4. Using Research Findings to Improve the Stormwater Program

State and local governments shall use research findings to improve local programs (SW-1), the technical manual and NPDES permits (SW-2), programs to control runoff from state highways, (SW-4) and CSO reduction plans (SW-6). Federal and tribal governments shall use research findings to improve stormwater management practices on their lands (SW-5). Businesses shall use research findings to improve their practices (SW-2).

Target Dates for SW-7.1 through 7.4: The Action Team support staff shall convene committees to assess research needs and share research findings every two years, beginning in July 2001.

SW-8. Measuring Program Effectiveness

The Puget Sound Action Team support staff shall evaluate program results through use of program and environmental performance measures. This supports the adaptive management approach described in the Estuary Management Program of the *Puget Sound Management Plan*. At a minimum, these evaluations should incorporate information from the following monitoring and assessment sources.

a. Program measures that track implementation of this program:

- Adoption of local comprehensive stormwater programs;
- Timely issuance of federal stormwater permits; and
- Reduction of combined sewer overflows.

b. Case studies that assess the effectiveness of program actions:
   - Findings of local government monitoring as called for in SW-1.

c. Performance of environmental conditions for which this program is a major or important determinant (recognizing that these measures may be affected by several plan programs):
   - Area of sediments that exceeds sediment management standards;
   - Extent of toxic contamination, as measured by liver lesions in fish;
   - Changes in conditions and classifications of shellfish growing areas that are affected by stormwater runoff;
   - Surface waters listed on the state's 305(b) list due to stormwater runoff; and
   - Percentage of salmon streams with flows that, over time, closely mimic natural conditions (from the Governor's Salmon Recovery Scorecard).